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ROYAL ARCHITECTURAL INSTITUTE OF CANADA

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ROYAL ARCHITECTURAL INSTITUTE OF CANADA

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JOURNAL
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MAY 1950

WE were interested to read recently in the press that Mr. John Parkin had fired a broadside at that old enemy, the pre-war school. Mr. Parkin did not say which war, but the schools he described were "fortresses". The word "fortress" is a useful word for the purpose because it is meant to convey everything that Neo Plastic Man finds horrible in a school. It brings to mind a building that is the antithesis of the schools illustrated in this *Journal* for the merry month of May. In brief, drab walls and sash windows on two or three floors are contrasted with glittering walls of glass on one floor.

NO one will gainsay the enormous advantages of the new school for both pupil and teacher. Bringing daylight into the classroom is a notable achievement, but is it not something we might almost take for granted in a scientific age? Other people have done the same for poultry, and we are certain that no modern hen will lay an egg on the row of nests furthest from the window unless she enjoys 30 ft. candles. She must be in a room that is bright without glare, and the scale of the room must be that of a hen and not of an ostrich. Ventilation must be adequate and regulated for winter and summer conditions. Playing areas must be sunny, drained and suitably surfaced. Only in matters of plumbing are the school and the hen house dissimilar. Both child and hen have emerged from the murk which another age took for granted to the controlled light which this age demands. What we have yet to discover is where the hen and the child part company.

HAVE we not reached a place in school architecture in Canada, as others have in all countries, where we have to address ourselves to the question — "Is function enough?" We have standardized the classroom, standardized the daylighting; proportion and scale are no longer matters for judgment and study, but are preordained by height of sill, clear glass, and glass block. A great many architects are still experimenting, but there are also the foot soldiers for whom precedent is good enough. In the best schools, do we take into account the soul of the child? Are we not supposing a maturity of mind that can appreciate abstractions like proportion when actually we are dealing with young eager minds who need a balance between abstract beauty and something else. The something else is the unsolved mystery. It may arise from new materials (or old), texture, colour, plain fun like Mr. Saarinen's plan of the school in brickwork at Crow Island or as a combination of all. In setting a new goal of humanism, we must avoid the pitfall of sentimentalism. As we have outgrown the house as a "machine to live in", we are outgrowing the school as a machine to learn in. In saying so no ammunition is provided for those conscientious diehards who find in the 18th century the best expression of the culture and aims of the contemporary Canadian private school. We find it better to be ever seeking improvement in a creative, dimly seen present, than spending ones days in the contemplation and imitation of a clearly seen past.

WHAT we have said above represents the feelings of every architect who is a sincere designer. Historians will note in this issue the efforts of some to humanize an otherwise standardized school. Kindergartens, throughout, have received most attention as though, there, the architect could really enter in spirit into the life of a child and provide rooms that were gay with colour and admirable in shape. Mr. Easton's photographs show how far Switzerland has gone with texture of material, sculpture and painting to relieve the austerity of the cube.

IN certain provinces research into daylighting and artificial lighting have gone far enough, and in all provinces, we presume, the physical needs of the child are well taken care of. We can now turn our attention to things of the spirit, of beauty and joy. So long as emotional appeal is lacking in our school buildings, we cannot afford to be smug about financial, practical and quasi-scientific achievements.

Editor

THE POST-WAR SCHOOL BUILDING PROGRAMMES IN GREAT BRITAIN AND WESTERN EUROPE

By J. A. G. EASTON

I WAS commissioned by the Hon. Dana Porter, Minister of Education for the Province of Ontario, to make a survey of School Building Programmes, completed or planned in the post-war period in: – England, Scotland, N. Ireland, Eire, Norway, Sweden, Finland, Denmark, Holland, Belgium, France, Switzerland and Italy.

Considerable preparation was made in the way of securing introductions and credentials to senior officials in the various countries concerned. This was done mostly through the good offices of Dr. J. G. Althouse, Chief Director, and Dr. F. S. Rutherford, Deputy Minister of the Ontario Department of Education. Much of the success of the survey can be attributed to the introductions as furnished by these gentlemen.

Mr. A. J. Hazelgrove, President of the R.A.I.C. furnished me with introductions to the Architectural Associations in each country. He further entrusted me with the honour of conveying the respects of the R.A.I.C. to each Association. This was a pleasant duty. The compliments were received most gratefully and were most graciously returned. The success of the survey was made doubly sure by the kind co-operation of the Architects and I should like to take this opportunity of expressing my gratitude for their help and hospitality, which was so readily extended to me as the representative of the R.A.I.C.

The survey took a period of 82 days during the months of May, June and July 1949. A distance of 20,000 miles was travelled mostly by air. Some 350 schools were visited and I met one Prime Minister, 3 Ministers of Education, 150 School Administrators, 50 Architects and Engineers and various Government representatives. The co-operation and kindness of all these persons had everything to do with the completion of the survey in the limited time at my disposal.

The completed survey takes the form of some 50,000 words, 1,000 still pictures, and 1,000 ft. of coloured movies. This work was done on a day-to-day basis so that the job was completed upon the day I arrived back in Canada. This was made possible by Mrs. Easton who accompanied me and who took a most active part in making the survey.

While such an assignment may be a laborious task, it was lightened by the changing scene when passing from one country to another. The main sustaining influence, however, was the trusting and ready smile of the children everywhere, which served as a sheet-anchor, where conditions were not only trying but at times distressing.

The original copy of the survey has been made available to a number of Canadian and American Educationists and Architects. It has also been used as the basis of an address to the Canadian Education Association at Fredericton and to the National Council on School-House Construction at Indianapolis. A highly condensed summary was published by the Canadian Education Association in the form of a "News Letter" which was distributed across Canada. The information contained in the News Letter was broadcast over station CJRT-FM at the Ryerson Institute of Technology, Toronto, during December and January in a series of four broadcasts.

In the April 1949 issue of the *Journal*, the Editor expressed the hope that the answer to school construction might be brought back to Canada on a platter. I regret to report, that while many of the schools which I visited are of considerable merit, the merit was associated with the country concerned and in many cases was limited by tradition and economic difficulties. While we may profit considerably by the experience of others, there is nothing to indicate that our difficulties are great and that they cannot be solved by the continued enthusiasm and ingenuity of Canadian Architects.

In order that my good friend the Editor be not entirely disappointed, I am happy to report that the R.I.B.A. saved the day and promised to send the "News Schools Exhibit" to Canada. The Exhibit consists of some 40 plates which illustrate graphically and pictorially the School Building Programme in England. The cost of preparing the Canadian copy together with its shipment via air to Canada was borne by the British Council. The initial showing was at the Annual Meeting in the Fort Garry Hotel, Winnipeg. Arrangements were made at that time for the Exhibit to be loaned to the Architects Association across Canada.

The following brief notes have nothing to do with design but are pointed at the need for and the way in which school accommodation is being established in various countries. The reader will appreciate that much of the information contained in the original survey was given freely and in some cases confidentially. In order that confidences may be respected and embarrassment avoided the countries concerned are not specified.

Only last week I was visited by a senior school administrator from a foreign country which has a population of some 7 million. While educational requirements in his country are much greater than in ours, he stated that the country was obliged to maintain an armed force

of 100,000. He further stated that the preservation of his country's independence was of paramount importance and that education must suffer a decline while the national effort is concentrated on freedom.

All of the countries which I visited have a great need of school facilities. This need depends upon the loss of school plant as the result of war damage, changed economic circumstances, increased school population, interruption of schooling, rise in school leaving age, extension of curriculum, introduction and extension of vocational training and of social services in the way of school meals, medical attention, youth clubs, and community programmes which have been attached to schools as the most convenient agency.

These needs are not limited to countries which were at war, although it is noticeable that neutral countries and also those which had advanced social legislation prior to the war have less difficulties than the others. Neutral countries which enjoyed high levels of prosperity during the war years are now obliged to adjust their economy to meet competition as the war torn nations re-enter trading markets. This curtails school building.

While the need of school facilities is great, the ability to implement the need is lacking in varying degree. Some countries have accumulated building funds but strict allocation of materials and labour for construction work demand that industry and housing enjoy a preferred priority. Other countries retire the cost of school construction over 50 to 60 year periods. All countries have long term planning programmes which indicate that facilities as contemplated or authorized by legislation will not be completed in less than 15 to 20 years. Materials are in short supply. Countries, except the Baltic States, are short of timber. One country does not permit the use of more than 3,200 feet of lumber for the construction of a whole house including framing, floors, roof, trim and doors. In the same country pupils in manual training shops are limited to 3 F.B.M. of wood per annum. Steel is in short supply owing to the allocation of large amounts to industries engaged in export. Productivity is low in some countries for various reasons. In one country it is claimed that before the war one man built one house in one year and that it now takes 1.8 men to accomplish the same result. One country which enjoyed 80% self-sufficiency in food before the war is now reduced to 40% in this regard. On the other hand, metal manufacture is 50% above prewar levels since war obligations under peace agreements require that a substantial part must be paid in manufactured metal goods and ships. In this country a tin of fruit salad which sells for 30 cents in Canada sells for $11.00 in the hotels. Some countries are obliged to use wood, peat, or coke for fuel. They hope that coal will become available this winter.

Most countries suffer from a shortage of teachers although one has a considerable surplus. In some countries 70% of the teachers are women which is an indication of serious man power shortage. There is a wide variation in the rates of pay for teachers. In certain urban areas, teachers are obliged to do extra work in order to make a living. The rates of pay in other places are quite generous and teachers are held in high esteem. In general, the salary of teachers is considerably below that of other professions and teachers are held in much less regard. Indeed, in one country the feeling was that the teacher was nothing but a high grade servant.

Strangely enough the extension of schooling together with social services which have become attached to education demand more responsibility, greater effort, and more time from the teacher. In many cases, teachers are obliged to assume evening duties concerning youth clubs, community programmes and the like, since they seem to be the persons best qualified. Some countries realize that the increased demands on the time of the teacher may result in a deterioration of the teacher's regular work.

In almost every country much has been accomplished in the way of school building in the post war period. In the countries which were at war most of the effort has been directed to the repair of war damage which has been completed. This represents a prodigious effort; for instance, London with a population of almost twice that of Ontario lost 50% of its school accommodation by bomb fire. In addition to rebuilding most countries, particularly England, are also engaged in new building programmes which assume vast proportions. Many countries find that new school accommodation as planned in the post war period is impossible to achieve owing to the limitations of budgets and the competing requirements for labour and materials as demanded for industry and housing which command higher priorities. In some cases the plans for school accommodation are severely limited. In one country, the maximum amount permitted for one classroom is $5,000.00 which means bare facilities without plaster, central heat, or anything in the way of ordinary appointments. Another country will not sanction a building proposal in urban centres until schools are working on double shifts. In another place the funds are plentiful for school purposes and although materials have been allocated, they are in short supply and cannot be procured. A number of countries permit only the construction of classrooms and essential washrooms. The construction of auditoria, gymnasia, shops, home economics and other special rooms must be deferred until the need for classrooms is satisfied. In only one or two countries is the size of classrooms as great as that found in Ontario. In two countries the area is only one-half of the Ontario classroom. Despite this limited size the rooms are furnished to seat 48 pupils. In most countries schools are of an austerity type. It is only in one or two countries that schools boast the degree of appointment found in the schools in Ontario. On the other hand, traditional design in some countries dictates the inclusion of large amounts of non-instructional

areas which in Ontario would be considered reckless extravagance.

Many countries try to circumvent building difficulties by resorting to prefabricated structures. Although these structures have considerable merit the public are not satisfied with these buildings except as a temporary expedient. In addition prefabricated structures usually cost more than buildings of the conventional type.

School facilities are limited. Some countries are obliged to operate on 2 and even 3 shifts and the children attend on Saturdays. In rural areas, it is sometimes necessary for the pupils to take turns and attend on alternate days.

Increased school population and the drift of population to urban centres present many difficulties. Satellite or dormitory towns are being built around large cities to provide housing for the city workers. In one country the urban areas have become so densely populated that extra living space can only be found in rural areas. This has precipitated a rural school building programme which involves several thousand small schools of the one to four room size. In order to attract staff to these schools it is necessary that each one include quarters for the teacher and his family. In many cases the caretaker is housed in an apartment within the school. Some countries anticipate a decline in school population around 1956 and they expect that schools will be overcrowded in the interim. Adequate school sites are difficult to find particularly in urban centres. Some authorities contemplate sending the children via public transportation to green belts one day a week for play and exercise.

In most countries the cost of school construction per square foot is equal to or more than that in Ontario. The cost per pupil, however, is more in those countries where schools have large amounts of non-instructional areas.

Schools are financed jointly by the federal, provincial and municipal authorities. The participation of these various agencies varies widely. In one country the federal authorities contribute 50 cents per annum per pupil while in another country the same authority underwrites the cost of construction by 65% and also contributes generously toward operating costs. In one country federal authorities pay 70% of the total cost of education and the municipality 30% while the province makes no contribution since it does not collect any revenue.

A school milk and meal programme is in evidence in most countries, particularly in those where food is scarce. Only a few countries offer this service at no cost to the children. In most cases a charge is made to cover the cost in whole or in part. One country with limited supplies extends the meal service to 40% and the milk service to 90% of the children. This country will extend the meal service to 75% when dining room facilities become available. In the meantime, the public subscribe heartily to the idea and there can be little doubt that the service is about the only way in which some nutriment can be guaranteed for the children. Some countries take the position that the child belongs to the home and that the school has no business in the matter of feeding. These countries, however, do not lack food supplies.

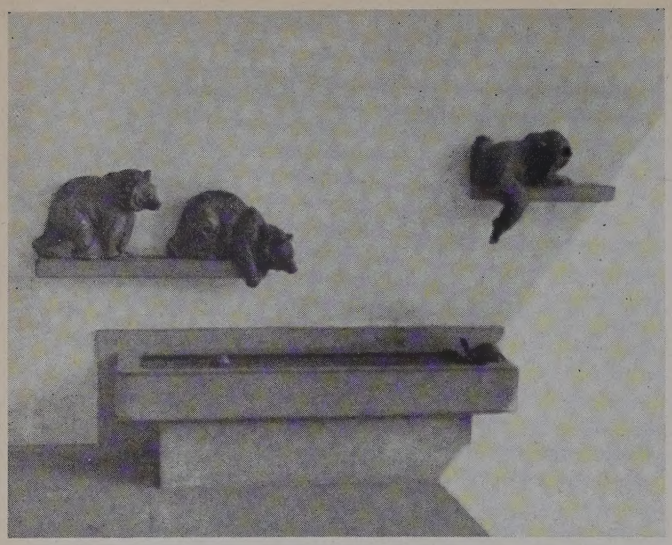
Some points although of a minor nature proved to be intriguing. The Canadian troops made quite a favourable impression. It is interesting to hear school children singing "O Canada" in a foreign language. Some school football teams in foreign countries enjoy the sobriquet "Canadianne." Schools and playgrounds in many cases are kept scrupulously clean and tidy. The children automatically pick up the tiniest scrap of paper and dispose of it in the refuse containers. In some places, the boys greet the stranger with a bow and the girls curtsey. The boys are a little self-conscious in doing this but the girls act naturally and gracefully. Some universities adhere strictly to their time honoured function and pay little attention to training for technological pursuits. They claim that such training is lost since the graduates migrate to other countries.

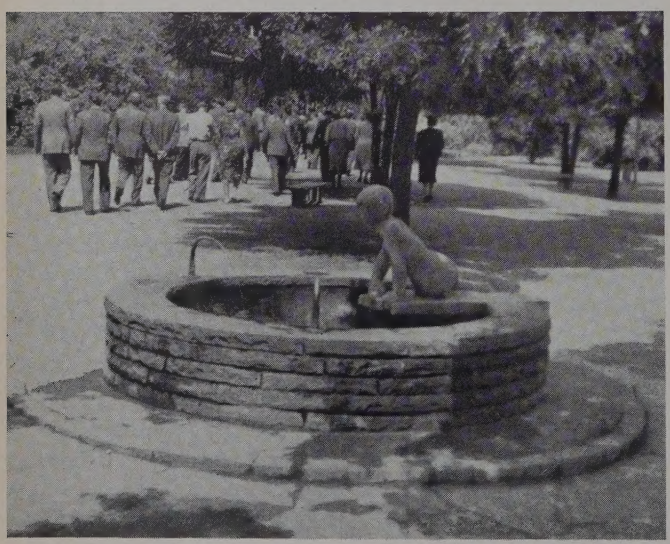
Schools in practically all cases are designed by architects. It is only in a few cases, however, that the architect is commissioned on a private basis. In some instances the architect is selected by means of a competition. Sometimes the architect is responsible for the structure and engineers are retained independently for the mechanical trades. It is quite common for architects to be employed by the state, county or municipality as public servants. While this is done it is interesting to note that the architects in most cases have preserved their identity which is reflected in the individual character of their work. In one country, schools are designed principally by civil engineers. Both school administrators and architects deplore this situation and it is hoped that it will be rectified. In another country schools are designed and built by a central board of works which pays little attention to the needs of school men. This has resulted in drab monotony and complete deficiency of educational facilities. Schools built under this system as recently as 1945 stand as monuments condemning centralized planning.

Monetary difficulties are manifold and disconcerting. Budgets for schooling particularly in countries which have suffered major devaluation of their currency reach astronomical amounts. It is no uncommon thing to hear that a school will cost one quarter billion units of currency. Costs have increased by 5, 10, and 50 times beyond prewar costs. The visitor after admiring a beautiful school, built in prewar days, is sometimes shocked to hear that such a school can never be duplicated.

An attempt to analyze or comprehend the difficulties of other people is difficult; it might also be futile. Nevertheless, one has no difficulty in finding a sincere sympathy and appreciation for their problems coupled with a profound admiration of their courage and determination to meet the situation.

By comparison we in Ontario have few problems. We were not invaded; we did not suffer from bombfire; there





is a profusion of materials and there is no lack of food. There is a well organized school system which has been substantially expanded in the post war period. It may not be perfect but plans for improvement are not subject to the dire limitations which are imposed in many countries. It could be said that many of the immigrants who helped to build this country were attracted by the fact that schooling for their children was assured. In proportion to population, Ontario has established more school accommodation in the post war period than any of the countries visited.

While obstacles in the path of education may vary from one country to another, the sincere efforts made by educators everywhere remain the same. Boards, administrators and teachers feel a great responsibility for the continuance and improvement of schooling. Fear is sometimes expressed that burdens in the way of extra services which are loaded with abandon upon the school may prove to be insupportable.

Gold is where you find it. There is an unlimited supply in all classrooms, in all schools, in all countries, – the children. They are not inanimate. They will respond physically, mentally and morally according to the treatment given. We must recognize the opportunity and make determined efforts to surmount any and every difficulty to assure schooling to all children everywhere.

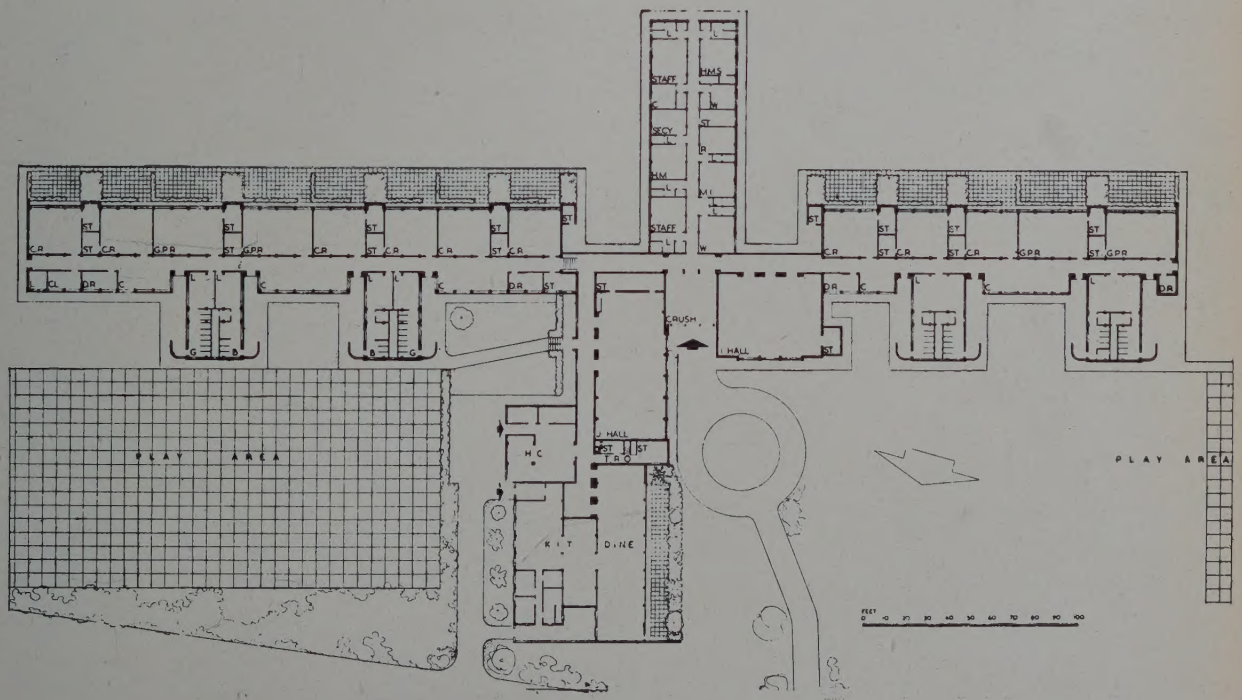
In conclusion I would submit that the best intentions are limited by practical considerations. Each country visited has good intentions but all are limited, though some more than others. Canada is no exception to the rule. As far as Ontario is concerned, the people can have whatever kind of educational facilities they desire and can afford which will permit the children to work, and play, and live, and grow.

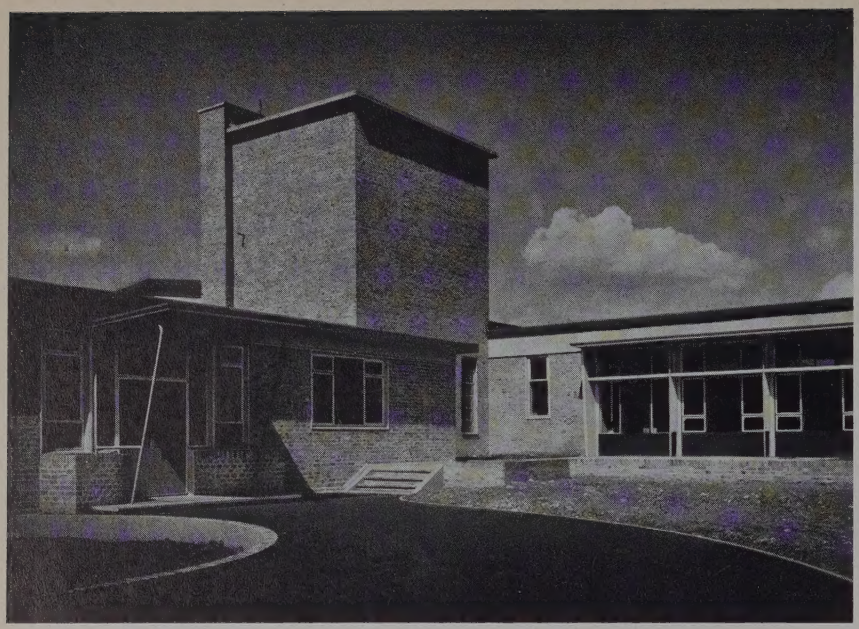
Photographs of details of schools in Switzerland on this page were taken by Mr. J. A. G. Easton

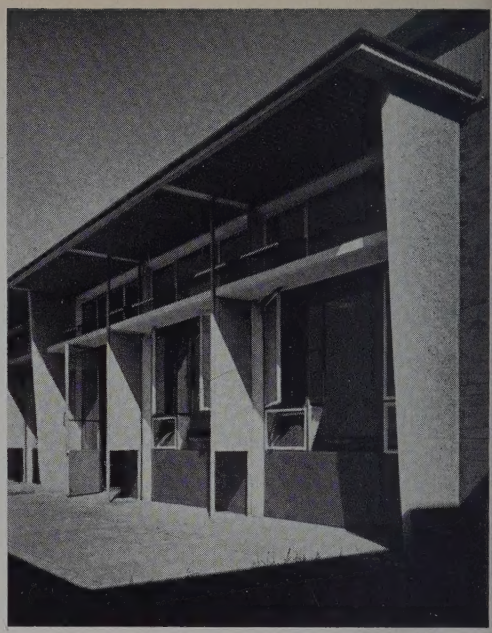
PRIMARY SCHOOL, CRANHAM, ENGLAND

HAROLD CONOLLY, ARCHITECT

The classroom wing fitted with sloping concrete baffles and fluted concrete outer skin above. This skin contains a duct, fitted internally with hinged access panels



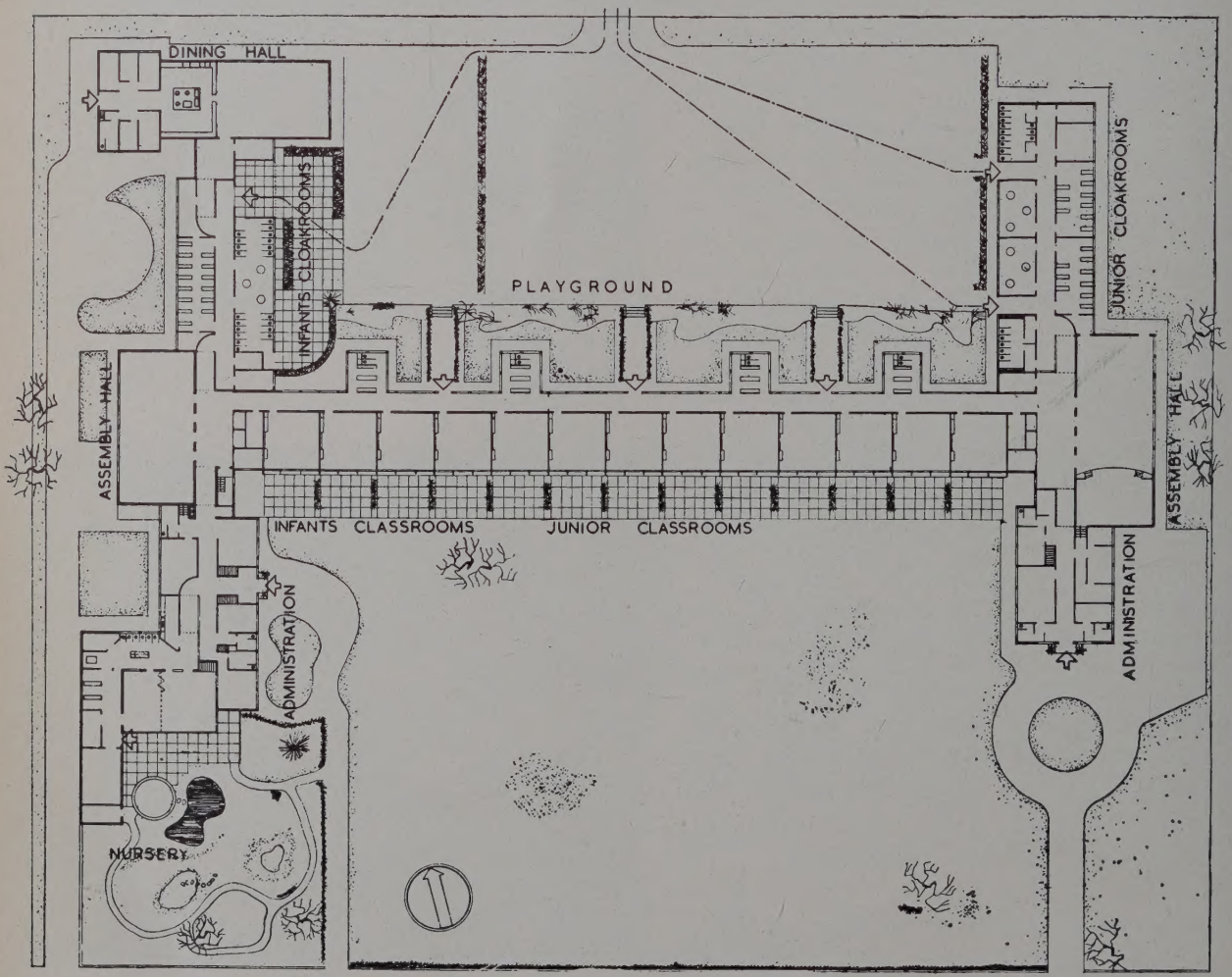




Baffles and hoods which control the working-light of class-rooms and prevent sun glare

MANFORD WRAY PRIMARY SCHOOL, CHIGWELL, ENGLAND

HAROLD CONOLLY, ARCHITECT



The Nursery, with covered play terrace, and area for sand and water play

Approach to stage from auditorium

General view from the play area

CLASSROOMS, THEIR SIZE AND SHAPE

By LAWRENCE B. PERKINS

WHEN asked to write an article for these pages, the only suggestion made was that I deal with the size and shape of classrooms in elementary and secondary schools. I have ideas on the subject, but present no formula. The specifics must, and will lie with the individual architect and the problem before him.

A classroom is simply defined as a room in which classes meet. The first one was probably not even that. It was probably a pleasant field with a few nearby trees for shade and perhaps a hill whose gently rising sides took care of the seating arrangements. It provided a maximum of space and light and is probably still in use, but the first violent rainstorm revealed a major drawback — no roof. So the builders of antiquity provided one and with it ponderous walls. We have been trying to get out ever since. It was not until the 20th century that the structural means to escape became available and only in the last decade have we had the courage to use it. Now, we are getting back to our first classroom and its space, its light, and its freedom. In the process, we are adding modern improvements.

Up to now we have been spending our money and raising some imposing monuments, but not necessarily to education. By the time we got around to providing the classroom essentials, the budget was often in disrepair — having been spent in a bow to Greece, Rome, the Renaissance, or possibly even our own Colonial days. So the classrooms somehow became smaller, regimented, and acquired a bad name among many of their inhabitants.

Today there are a host of us that believe it easier and better to fit the classroom to the children. To that end we have, in planning our work, consulted with those directly concerned with classrooms and schools. We have talked with teachers and school board members, with custodians and children. From all we have had worthwhile suggestions. Many have been concerned with specialized problems of their particular school, but all have indicated, sometimes in an inarticulate fashion, a craving for space and light and color.

These essentials we have tried to provide in the educational structures which we have brought to life on our drawing boards in the last few years. As a natural corollary we have also sought the economy, both of first cost and of maintenance, which first and last will limit the success of the school plant. And in keeping with our constant goal of spaciousness, we have consistently held to the *large* classroom.

To some *large* may be a terrifying word. But it need not be and our experience has been that the response to the large classroom by teacher and child alike is a happy one. Given space to move about, to make adjustments, the children have found it much easier to bridge that sometimes terrific gap between the home and the school. And no teacher given additional room within which to conduct operations has ever complained of it.

Exactly how large the classroom should be will depend upon the individual needs which may be complicated by any number of factors. You may not wish to limit the classroom to elementary instruction; you may wish to include adult night classes. Again, community requirements may call for instruction requiring alternate furniture which in turn requires space beyond what would normally suffice.

In any event, let us agree that the days when 10 square feet per pupil were allotted are days that are behind us. If we are to err in the allotment of space let us do it on the side of generosity. We need never fear that such an error will not be rectified. Already the thunder of the countless footfalls of the war-babies is in our ears — telling us that our schools are inadequate*; worse, that our classrooms are too small.

In all fairness, let us admit the small classroom was no accident. It was designed to fit the instruction practices of its day which concentrated on individual formal schooling. By designing smaller classrooms there could be more of them in which to instruct more children, limiting the children, of course, to 30 to a classroom.

What was not foreseen was the fact that educational facilities would expand to crowd the classroom with additional equipment — and that there would be more children. Today, having given the children what we consider more space, we may find even that space inadequate as the war babies crowd in upon us. If so, we will, in any case, be better able to handle them with our large classroom. And, if there is, on our terms of space, a misuse of the classroom in the next 10 years, there will not be for the 40 after that.

Making no little plans then, let us set a minimum of 30 square feet for each child as an ideal and approach it as closely as possible. That on a square would give us 30 feet on each dimension and 900 square feet. This is a generous supply of space, but we can put it to good use for our classroom is a self-contained unit. We are bringing the cloak room, the drinking fountain, the toilets, the

* A case in point here might be a school in a small isolated North Dakota town near the Canadian border. A metropolitan traveller expressed surprise upon learning that the large firesafe structure could accommodate more pupils than the town had people, had its own water and sewage system. He was informed that it drew students from miles around. He remained skeptical. His local guide then pointed out to him that the town had no fire department and that one careless blaze could consume the entire wood-built village with the single sure exception of the school, a refuge capable of sheltering the entire town until help came.

work bench and the sink all inside our spacious walls and making them all readily available. We can do this because nothing within our room is tied down. Its large, square dimensions give us conditions of greatest fluidity and flexibility.

Most of the facilities requiring plumbing fixtures can be grouped at one end of the room. Or they can be wherever you think them best suited. Nothing here is specific, nor law. Everything is determined by scientific research, inquiry and competent design thinking. We are merely indicating where we have on occasion placed our facilities. You may have, and we hope you do produce, different ideas. At times we have had our cloakroom hooks marching about the classroom; on other occasions, we have had them in the outer corridor. In this case, we have brought them inside. There we might put them in a wardrobe, which might be movable or one built into the wall. What is best for this particular classroom will determine.

The classroom's rigidity is limited to its walls. All else is fluid. Movable storage cabinets and benches and tables are used to make any number of instructional combinations possible. Group activities may be carried on at the same time as is individual activity. The work may be either formal or informal. In any case the room and its furnishings facilitate a maximum of accomplishment.

If visual-aids are a part of your teaching aids, as they no doubt will be some day, you will find the flexibility of the large square room a considerable asset. The simple drawing of a curtain can convert in a second a portion of your room into a miniature motion picture area. It takes but a minute longer to pull down a screen and move sufficient chairs so as to have one portion of the class viewing a current travelogue while the others are otherwise engaged. Visual-aid projector and amplifier, when not in use, can be housed in a wall cabinet or in your movable furniture. Your screen folds rapidly out of sight. And do not overlook the opportunity afforded you by your separating curtain. Use of a warm color in its cloth will brighten not only the classroom, but also the lives of its inhabitants.

Warm colors, natural surroundings not unlike those of the home, and comfort make the classroom not the sorrow it has so often been, but rather a place of delight. We should not call it another home, because it is more of a workshop. But as a center of activity, a place to do things, it should always be attractive.

One of the objections to a large classroom will be its cost. Whether in the long or short run it does cost more is definitely debatable. We take the negative. Our point is something else: that the classroom, and the facilities and comfort it affords the children within it, are entitled to first consideration. Given that, we can fit the existing budget to the problem at hand. Here there are an infinite number of possibilities.

Basic natural materials in interior walls can be left exposed. This reduces both construction and maintenance costs, gives color. Ceilings can also be lowered. They were originally raised for the purpose of light. Now using glass as a basic structural material, thinking of it not as a window but as a wall, we can afford to lower ceilings from 12 to 9 feet. Knowing that when we do, our light requirements will be more than fulfilled.

We like to build one entire wall, or even more, of glass. The more sunlight the child can have, the more one-ness and unity that he can feel with the outdoors, the more you will have expanded his world. Do not worry about his being distracted by what goes on outside. He will feel himself too much a part of it to let it interfere needlessly with his work inside.

And let us not be satisfied with lighting from one side only. Modern design makes possible bilateral lighting through opposite parallel walls. It does this by lowering the corridor roof and raising the classroom ceiling to a point where a clerestory containing windows can be worked out. This may call for a sloping ceiling. The acoustics will be the better for that.

In using glass the best results can be obtained with the transparent pane. Glass block, while appropriate for a variety of purposes, does not afford the psychological release that transparent window-to-floor windows give. Where it has a deliberate screen function — such as a garbage-heaped alley, fine, but not where the considerable admission of light is desired. Glass block also denies the illusion of space that is obtainable with the transparent pane. It also adds a color to the filtered light that is depressing and has a maintenance problem, i.e., frequency of washing.

An outgrowth of the large square classroom is usually a long work counter together with storage space set up along one wall of the room. Special attention should be given to the design of the storage space. The need for it will constantly increase. Use of the work bench will raise the issue of whether its vigorous utilization will not be a distraction and annoyance to others. One answer to this is people should learn to work together in common space without disturbing each other. Hence this objection can be turned into an educational advantage by one line of reasoning.

However, the large square flexible classroom is not the only one. We have limited ourselves largely to its discussion because of the difficulty of covering even its possibilities in the limited space available, and because its type is largely adaptable to any age group, elementary, high school, or adult instruction.

There are, of course, other types. One features a portion of the classroom cut off to form a glass-enclosed workroom. This enables the teacher, free from the noise of the workshop, to still supervise it visually while she conducts another part of the class. Some teachers will prefer this type of classroom; others will prefer the large, square one.

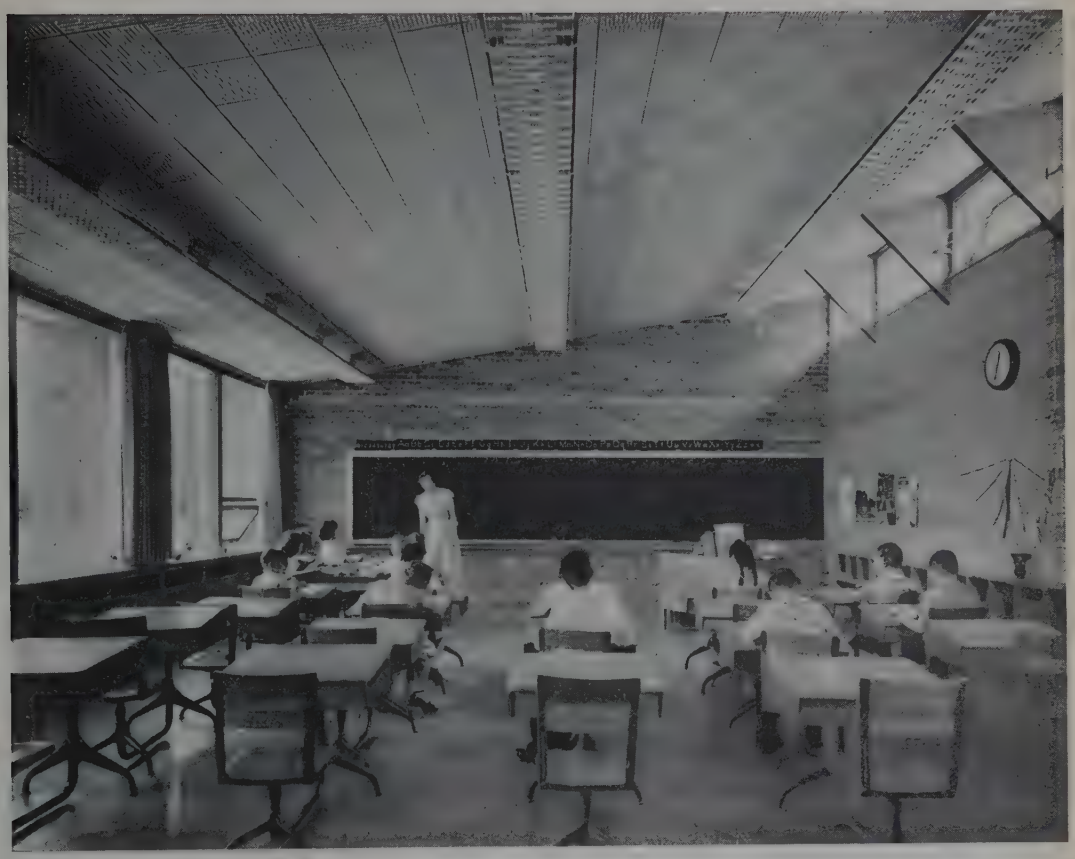
It does seem that the maximum community use will come from the latter. And today maximum use is desired

(Continued on page 180)

KINDERGARTEN

CLASSROOM EXTERIOR

Photographs by Hedrich-Blessing



TIME MAGAZINE'S CLASSROOM

THE LOBBY

Photographs by Hedrich-Blessing

1

2

Photographs by Hedrich-Blessing

3

4

1. Kindergarten. An extension of the home atmosphere into the school. Warm red colonial brick walls and fireplace, full length windows on each side of room. Tackboard walls of pine. Colorful animal form draperies

2. The playroom invites use by the entire community. Missing is the deep well feeling of the typical gymnasium. Instead floor-to-ceiling windows of safety glass. End walls of exterior colonial brick. Warm, hard maple floor. Arched truss roof, with acoustical tile ceiling

3. An amphitheatre of stone and wood heightens the year-round use of the "community park school"

4. Some school systems with highly-developed "activity"-type programs prefer the small workroom adjoining the classroom. Here youngsters can pound or smear paint without disturbing group activities, or small groups may receive special attention

THE SCHOOLROOM AS A THERMAL PROBLEM

By LESLIE THOMAS

THE modern architect has given a great deal of study to the problem of providing a satisfactory environment for the child at school. This study has resulted in a great improvement in the surroundings in which the young learn their lessons. One aspect of this environment which requires considerable thoughtful planning is the thermal environment, and in the present article it is proposed to discuss some phases of this problem.

The whole problem starts from the fact that every school child is a little heat radiator on his own. A class of 35 children can easily give off 10,000 B.T.Us per hour, which is the equivalent of about 67 square feet of hot water radiation. To put it another way, these children will give off as much heat as is lost through 260 square feet of double glazed window, on a day when it is zero outside.

From the child's point of view, therefore, his surroundings must be such that he gives off this heat in a regular and normal manner. On the other hand, the surroundings will tend to draw heat from the child at a rate which is dependent on the temperature of the air, the amount of air movement, the relative humidity of the air, and last but important, the temperature of the various objects and surfaces in the room.

The thermal environment must be so controlled that the sum of the various tendencies to draw heat from the pupil's body must just equal the rate at which he is producing heat, so that the body temperature may remain constant.

Producing the exactly correct thermal environment is much easier to say than to do. Schoolrooms are complicated by the fact that the population density is high. Space of 200 cu. ft. per person is normal in school classrooms. This is further complicated by the fact that the children usually occupy fixed positions in the room. Double glazing and adequate insulation of walls and roof are the first steps in thermal control.

Although the heat given off by the occupants has a great bearing on the overall thermal problem, it does not allow much saving in the radiation which is to be installed in the classroom. Walls, structure, air, furniture, etc., must be brought up to a satisfactory temperature before the children enter the room. Otherwise they will experience a cold shock when they are first in the room. However, once the pupils are in the room, it is important that the heating units in the room be capable of quick adjustment in their output, so that the output is lowered by the amount of heat that the pupils are now adding to the room.

The modern standard classroom has a large glass area along one side of the room. Unless provision is made to prevent it, this glass surface will be considerably cooler on the inside than the other inside surfaces of the room. The pupils who are in a fixed position close to the window are consequently subject to a greater radiant cooling effect than more remote pupils. Cold downdrafts from the windows would also effect the nearby pupils.

The problems suggested by the two previous paragraphs call for a source of heat in the room which has a very rapid response to changing heat outputs, both up and down. This source of heat should be located so as to offset the effect of the large windows. The modern convector located under the windows, with hot water as the heating medium, fulfills these requirements admirably, and at relatively low cost. This arrangement responds rapidly to changing requirements, and temperature control is relatively simple. Properly designed, this system is probably the best currently available for classroom work.

When the floor of the classroom is in the form of a slab on grade, the problem of insulating or heating the floors must be considered. If it is decided to heat the floor, very great care must be taken to prevent overheating. In this connection the writer would like to call attention to the results of a study made at the John B. Pierce Foundation, Laboratory of Hygiene, New Haven, Conn. Everyone is familiar with the hazards of cold feet, but we are not usually conscious of the more subtle hazards of feet that

are too warm, partly, perhaps, because traditionally, floors tend to be the coolest part of the room. Physiologists have discovered, however, that for optimum comfort and alertness the skin temperature of the feet should not be greater than 80 degrees, and the study referred to above shows that in order to prevent the feet from getting hotter than this, the floor should not be hotter than 75 degrees. The whole paper reporting on this study is worth careful examination, and may be found in the October, 1949, issue of the *Journal of the American Society of Heating and Ventilating Engineers.* The paper is entitled "Effect of Panel Location on Skin and Clothing Surface Temperature", and is by L. P. Herrington and R. J. Lorenzi.

Due to the previously mentioned high population density of a school building, the heating problem is complicated by the problem of ventilation. And in this case, ventilation means odour removal; the "lack of oxygen" exists only in the minds of laymen.

There is a rule of thumb which is often worth remembering when discussing ventilation. In the Toronto climate, it takes roughly a ton of coal per school year to heat the air required to ventilate one standard school classroom. Where the climate is colder, the amount of coal is, of course, correspondingly greater.

In planning classroom ventilation, the first decision which must be made is whether to use a supply system or an exhaust system. Simplicity and first cost seem on the surface to favour the exhaust system, and many such systems are installed. In the writer's opinion, a mechanical supply system to each classroom, with gravity relief or exhaust, has much more to recommend it for school work. It may be worth while to examine some of the considerations behind this opinion.

Whichever system is used, the result of the operation of the ventilation system is that stale classroom air leaves the building, and fresh outside air enters the classroom. In cold weather, this outside air must be heated to 70 degrees or thereabouts. The heat required for ventilation is a surprisingly large amount. While the ventilation system is operating, as much heat is used up in heating outside air as is used for all other heat losses combined.

The significant fact about this matter of heating outside air is that it makes no difference whether the classroom air is changed by an exhaust fan or a supply fan. With an exhaust system, it is necessary to increase the size of the radiators or convectors to supply the extra heat, whereas with a supply system, the air is heated by a separate heater before it is delivered to the classroom.

The choice between a supply system and an exhaust system includes a decision to save on ventilation, but spend more on the heating system. If this were the only decision involved, it would be possible to price the two alternatives. In many cases it would be found that the extra radiation needed for an exhaust system would pay for the cost of a separate heater for the ventilation air.

There are, however, other important advantages of the supply system. It must be remembered that the ventilation system is in operation only a few hours of the day, whereas the heating system must operate throughout the 24 hours. If the radiation has to be increased to carry the ventilation heating load, it means that the radiation is considerably oversize for the greater part of the 24 hours. Temperature control is obviously more difficult, and overheating of the classrooms, with consequent waste of fuel, is much more likely. The advantage lies with the supply system.

Two further advantages seem to favour the supply system. One is that it is easier to get draftless distribution with a supply system. The other is that supply systems will usually be less affected by the foibles of individual teachers.

A word about re-circulation may be of interest. To remove stale air from a room and blow it back in again seems a pointless operation. In certain cases, it is desirable to mix some room air with incoming fresh air in order to simplify control problems. Otherwise there is usually no point in re-circulation, unless the re-circulated air is treated in some way.

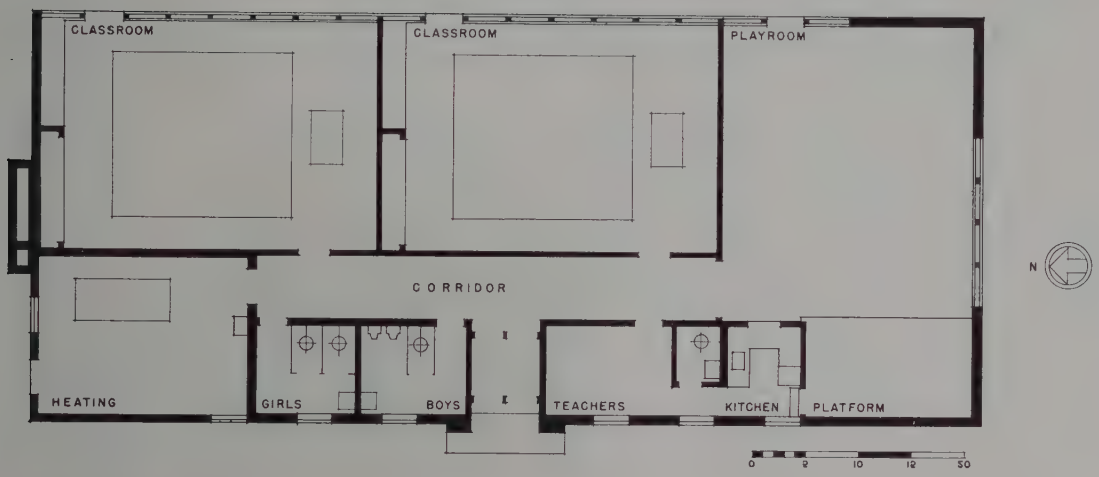
A completely new approach to the school ventilation problem involves treating stale air by chemical means. Remembering that school ventilation is installed for the purpose of removing or masking odours, it will be realized that this function can readily be accomplished by passing room air through activated carbon and returning it to the classroom. In this way, classroom ventilation can become 100 percent re-circulation. As no outside air is required, there is a substantial saving of fuel. The activated carbon installation is rather expensive, and there is a further cost of re-activating the carbon every few years. The decision as to whether the activated carbon installation is justified therefore becomes a question of comparing fuel savings with this installation cost. Where fuel costs are high and climate severe, this type of installation has a great deal to recommend it. An installation of this type is under way in a northern Ontario High School.

There was a time when one of the incidental chores which the school architect had to undertake in connection with a building was to get someone to make a heating layout. That day has passed. Research teams of engineers and physiologists have been exploring the whole field of metabolism and the thermal reaction of human beings to their surroundings. There is a much wider realization today of the vital importance of the control of thermal environment in its effect on health, alertness and comfort of the school child. At the same time, improved products and new materials, as well as a general increase in technical skill, are available for meeting the practical problems of modern building construction. It is the job of the modern heating engineer to incorporate this knowledge in the design of today's buildings.

ST. MARY'S SEPARATE SCHOOL

RICHMOND HILL, ONTARIO

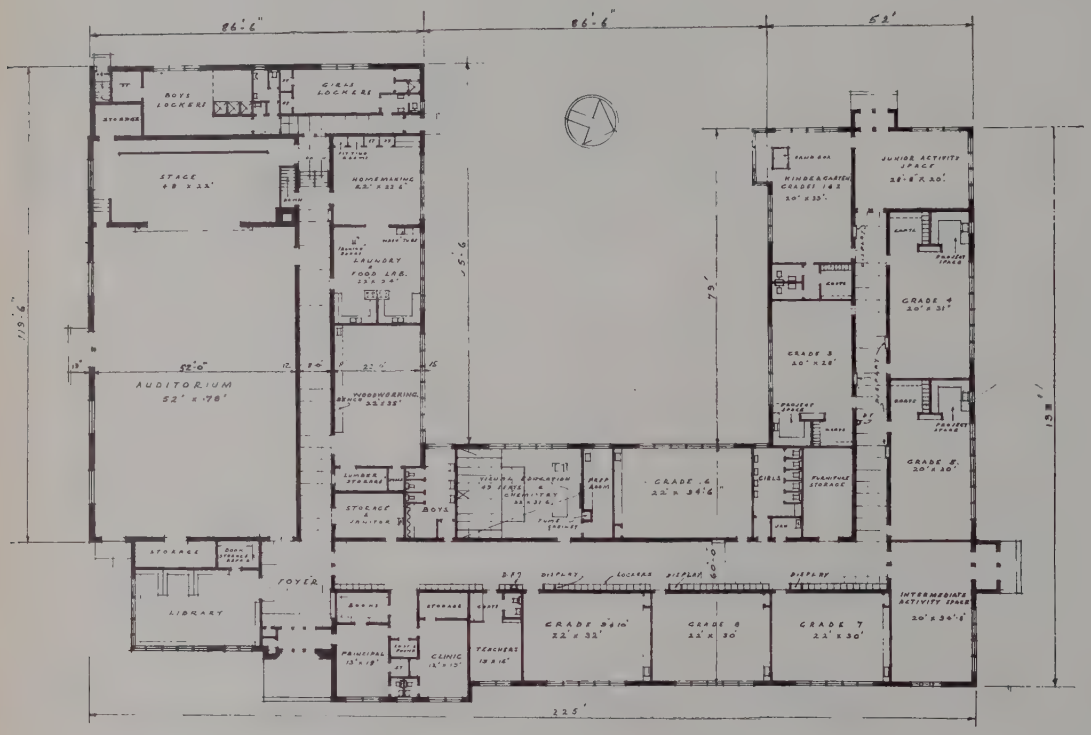
JOHN FRANCIS BRENNAN, ARCHITECT



Photographs by Panda

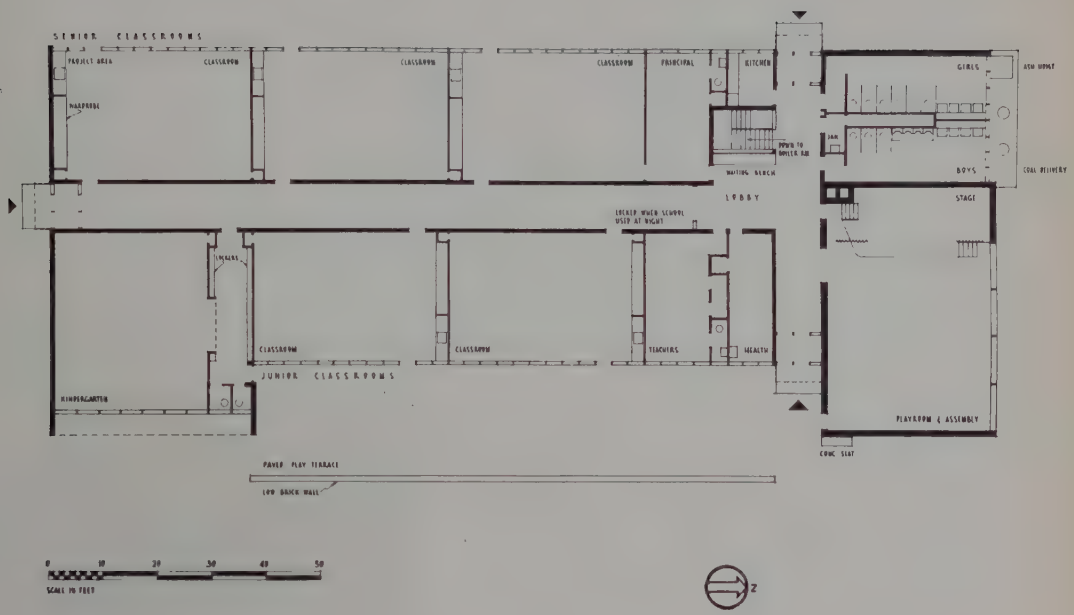
DRUMMONDVILLE HIGH SCHOOL, DRUMMONDVILLE, QUEBEC

A. LESLIE PERRY, ARCHITECT



PUBLIC SCHOOL, BOWMANVILLE, ONTARIO

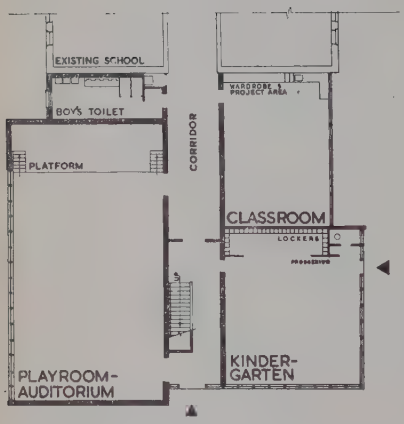
JOHN B. PARKIN ASSOCIATES, ARCHITECTS



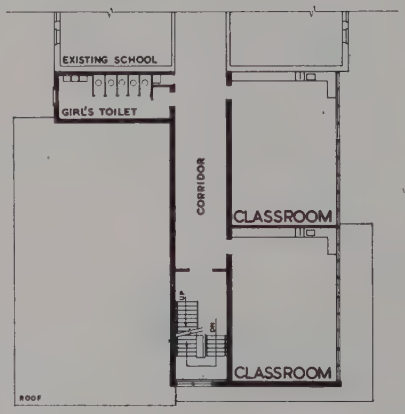
Photograph by Panda

RITSON ROAD PUBLIC SCHOOL ADDITION, OSHAWA, ONTARIO

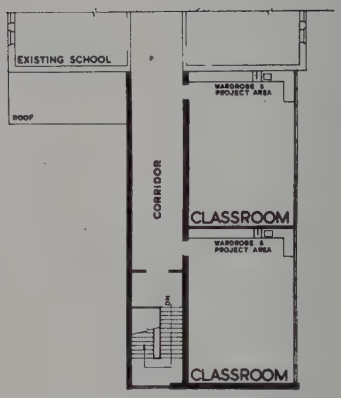
JOHN B. PARKIN ASSOCIATES, ARCHITECTS



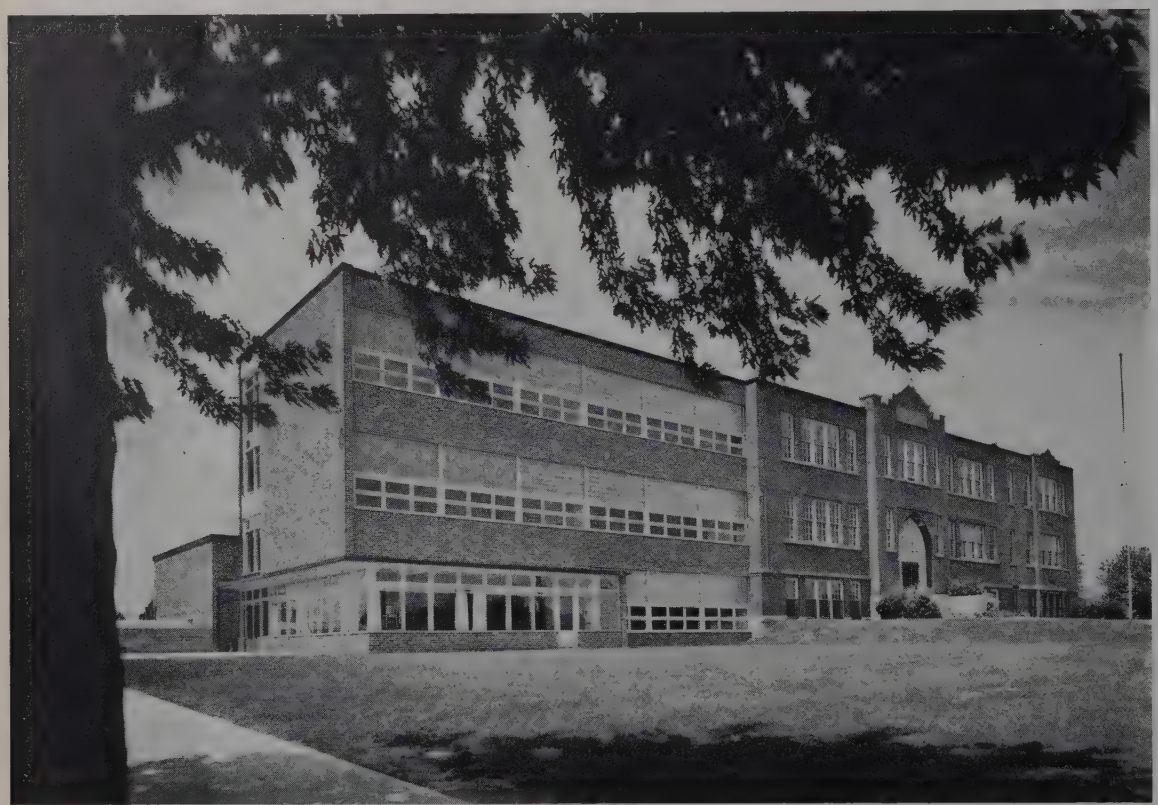
FIRST FLOOR PLAN



SECOND FLOOR PLAN

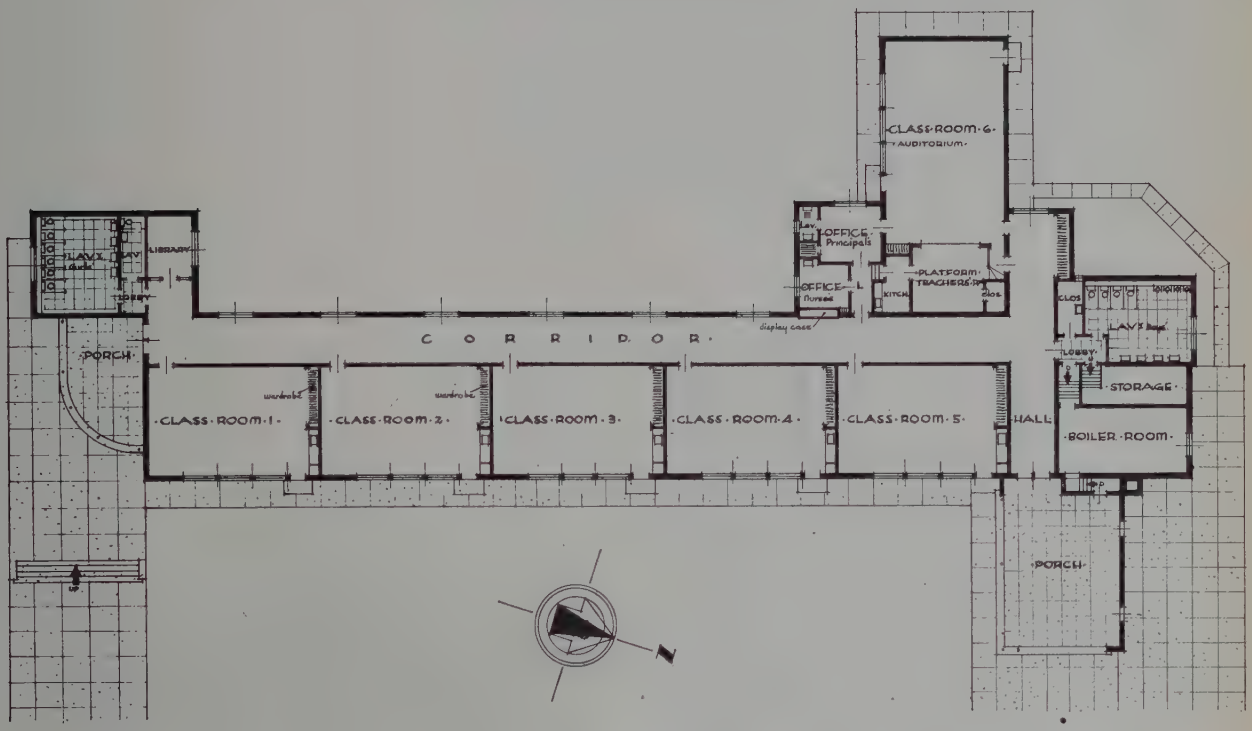


THIRD FLOOR PLAN



HERON PARK PUBLIC SCHOOL, SCARBOROUGH, ONTARIO

MURRAY BROWN AND ELTON, ARCHITECTS



Photograph by Gordon Rice

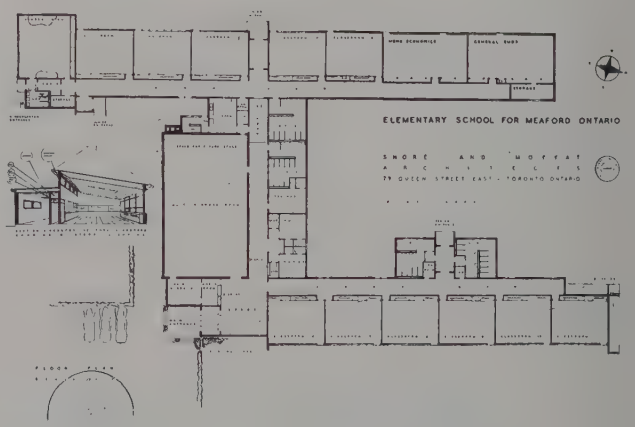
MEAFORD ELEMENTARY SCHOOL

MEAFORD, ONTARIO

SHORE AND MOFFAT, ARCHITECTS

Photograph by Panda

Classroom Wing



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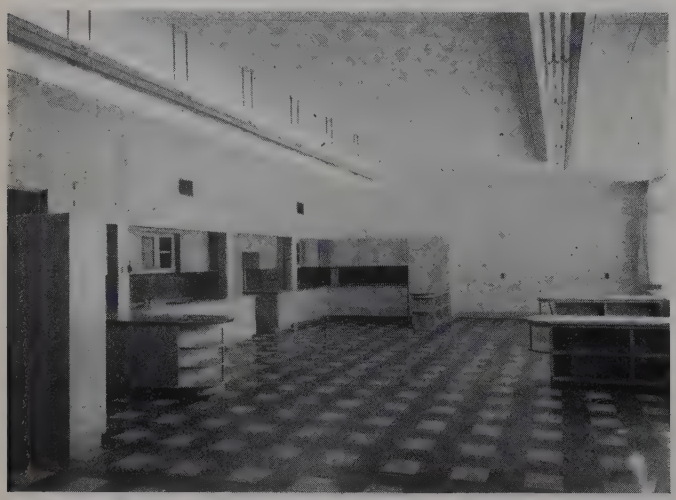


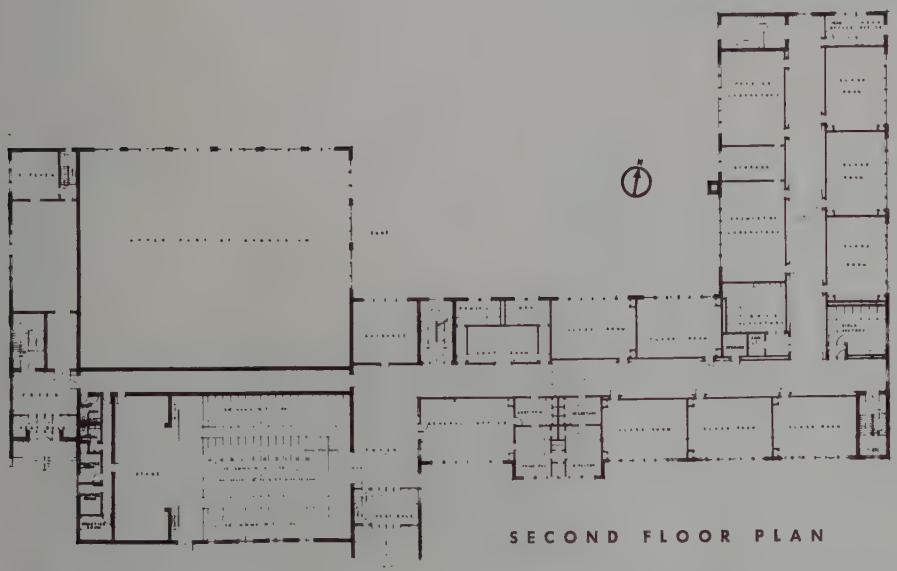
Home Economics Room

FOREST HILL COLLEGIATE INSTITUTE

VILLAGE OF FOREST HILL, ONTARIO

PAGE AND STEELE, ARCHITECTS

Administration Office



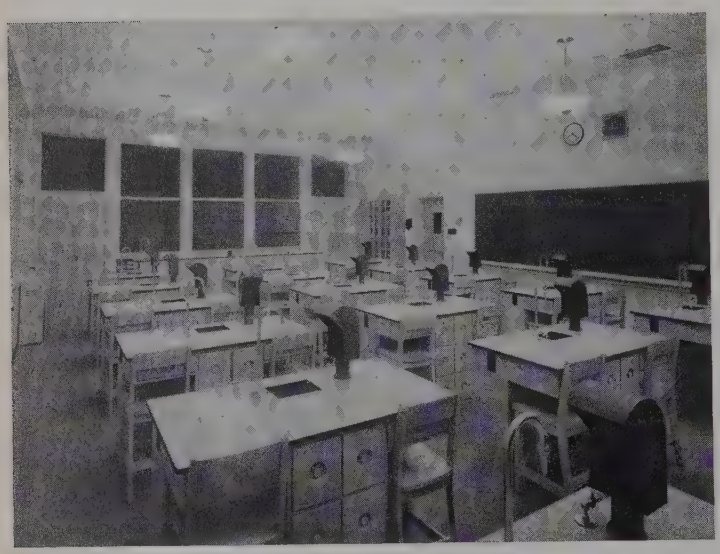
SECOND FLOOR PLAN

Photographs by Panda

EASTVIEW HIGH SCHOOL, EASTVIEW, ONTARIO

W. C. SYLVESTER, ARCHITECT

Sewing Room



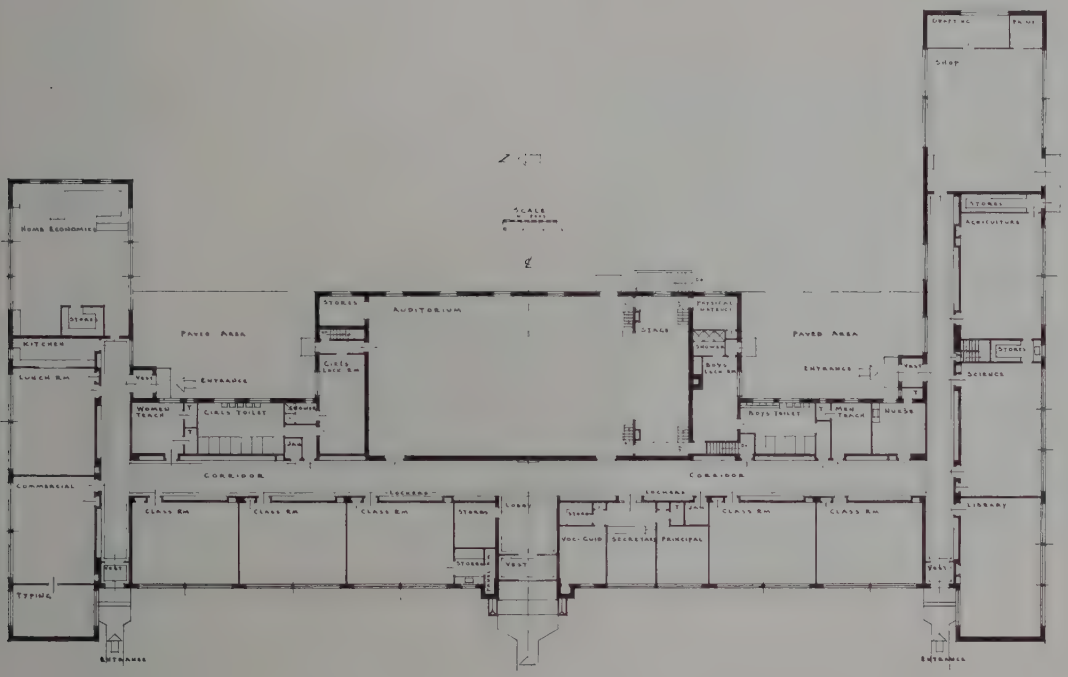
Chemistry

Photographs by Rapid Grip and Batten

GANANOQUE HIGH SCHOOL, GANANOQUE, ONTARIO

DREVER AND SMITH, ARCHITECTS

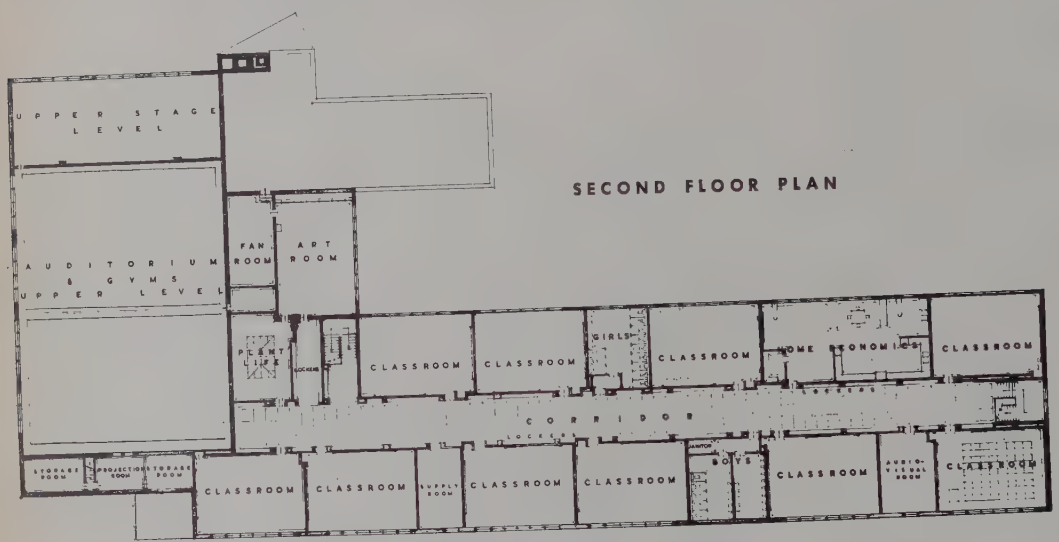
Entrance Lobby



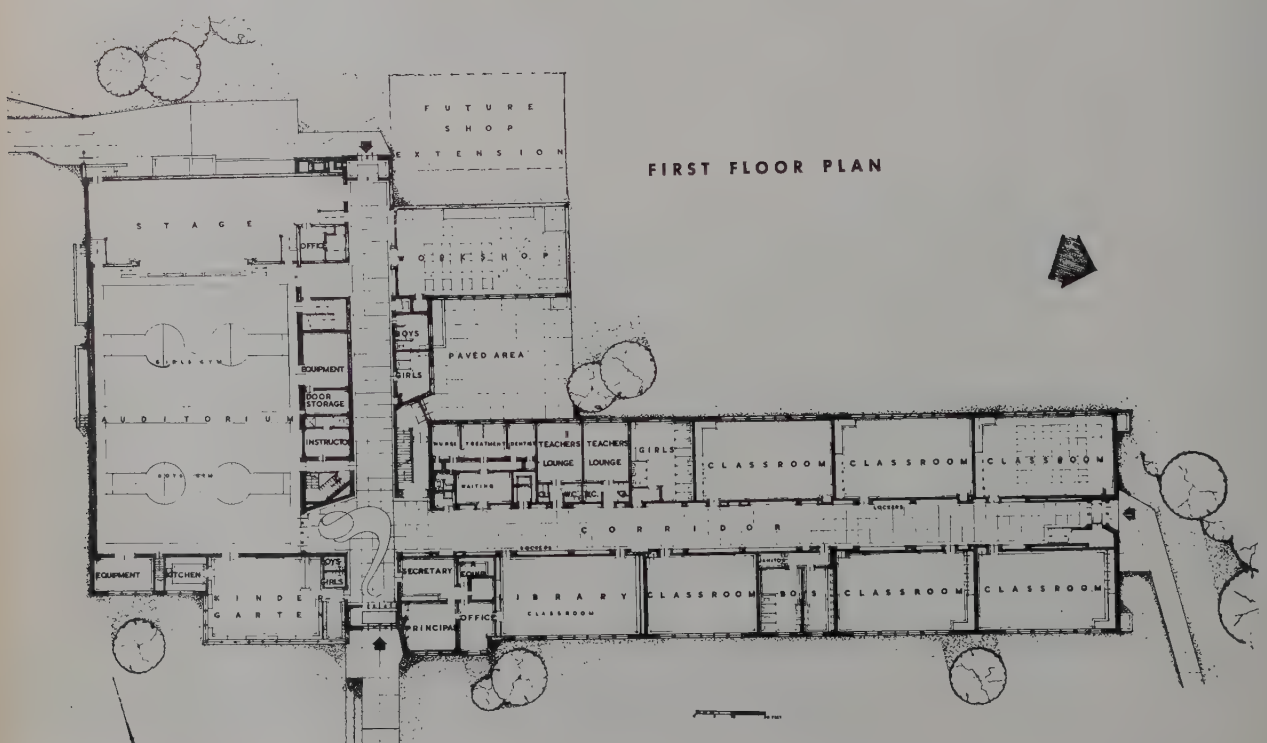
Photographs by Panda

PLAINS ROAD INTERMEDIATE SCHOOL, EAST YORK, ONTARIO

PARROTT, TAMBLING AND WITMER, ARCHITECTS



SECOND FLOOR PLAN



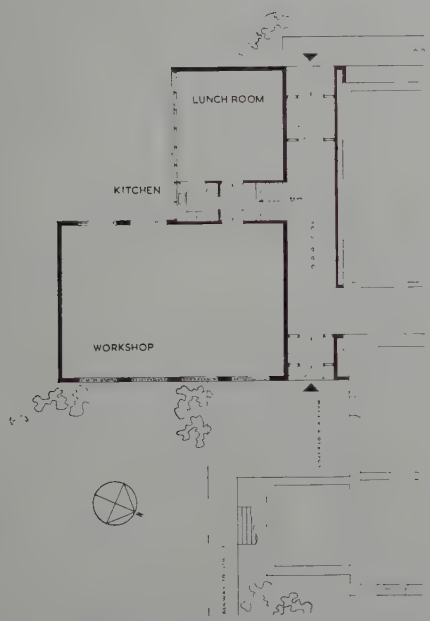
FIRST FLOOR PLAN

ALMONTE HIGH SCHOOL, ALMONTE, ONTARIO

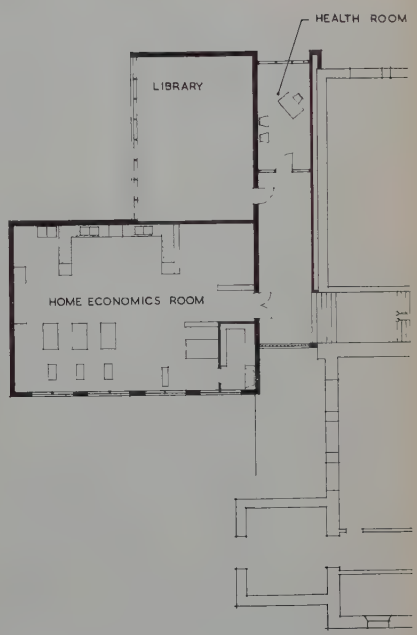
HOME ECONOMICS AND WORKSHOP ADDITION

ABRA AND BALHARRIE AND SHORE, ARCHITECTS

General Purpose and Library Room



GROUND FLOOR PLAN



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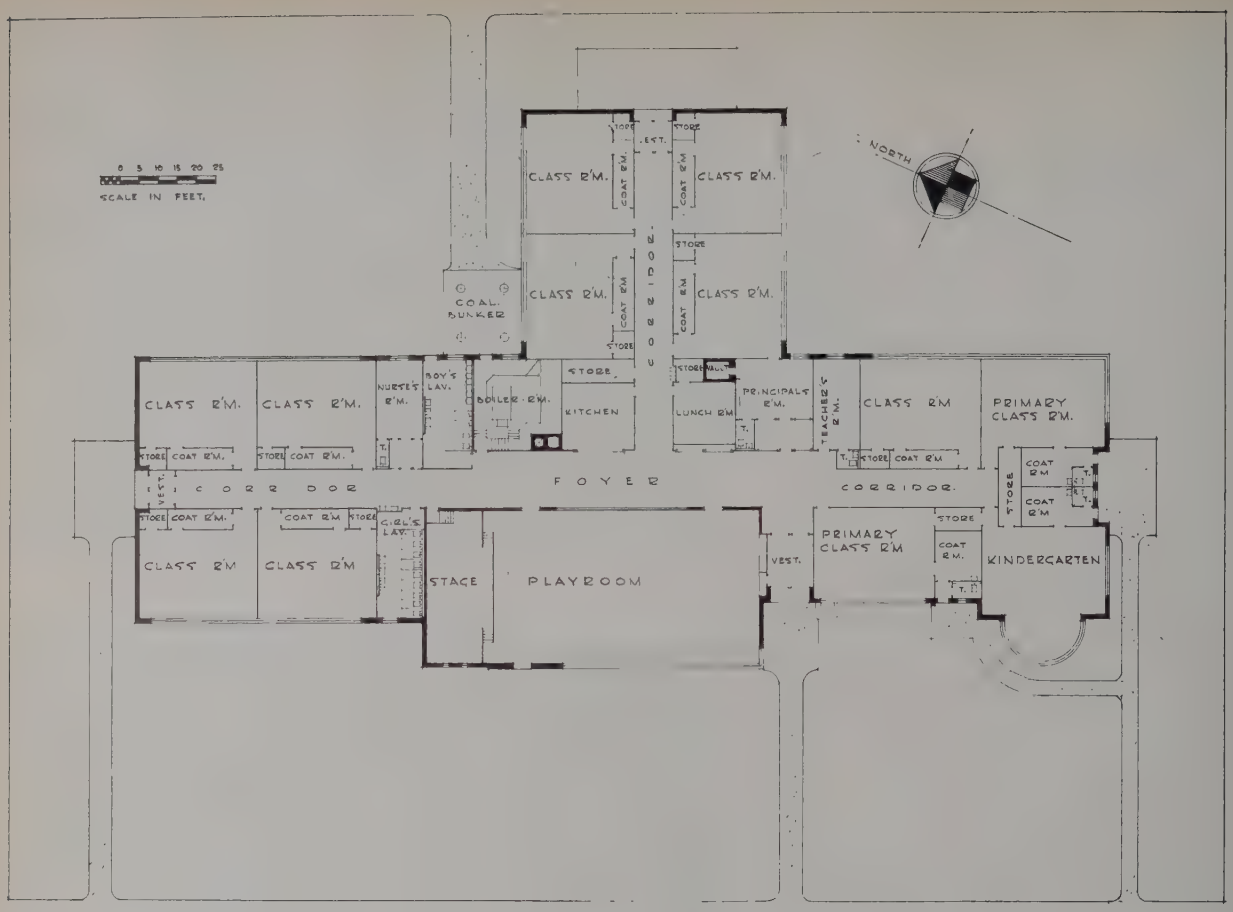

STRATHROY PUBLIC SCHOOL, STRATHROY, ONTARIO

S. B. COON AND SON, ARCHITECTS

SOLARSCOPE AND ARTIFICIAL SKY

By C. C. D. BRAMMALL

TWO new pieces of apparatus for the study of daylight and sunshine in relation to building problems have been devised by scientists of the Australian Commonwealth Experimental Building Station at Ryde, near Sydney, Australia.

One is the "solarscope", used for demonstrating with models the fall of sunshine on walls, roofs, and terraces in different latitudes and seasons and at different times of day. The other is the "artificial sky", also for use with models, to enable accurate measurement of direct and reflected daylight as it falls within a building.

The solarscope is an advance on the "heliodon" developed by the British Building Research Station. The artificial sky, based on a Swedish design, will, when completed, be the only apparatus of its type in the British Commonwealth.

Both the British heliodon and the Australian solarscope use a lamp to project a beam of light which casts shadows of roof overhang and the like. Each enables a graphic demonstration, with models, of the fall of sunshine.

But the heliodon makes use of a stationary light projected on to a tilting and rotating platform on which the model to be studied is placed.

The platform rotates about a vertical axis to simulate changes of the fall of sunlight at different times of day and tilts about a horizontal axis for different latitudes.

With the solarscope, the model remains immobile on a platform which neither tilts nor rotates. Controlled by worm and pinion drive, an arm projecting a beam of light revolves about the platform according to settings for latitude, season and time of day.

Thus it is possible to demonstrate to groups of students with a fixed model, whereas with the heliodon it is necessary for the observer to change his position, and sometimes to watch from awkward angles.

The solarscope consists of a stand to which is attached an arm which can be turned on a pivot through angles to represent latitudes between 0 degrees and 45 degrees. Attached to the near end of this arm is an electric lamp with a parabolic reflector. To the far end is fixed a mirror which reflects the beam of light back at the model on the platform.

The mirror produces the effect of a light 10 feet from the model, so minimising the divergence of the light rays while keeping the arm of the instrument of manageable length.

In use, the instrument is first set to the appropriate latitude, then to the various seasons and times of day. The model platform is marked with the points of compass, so that the model can be placed to represent the orientation of the building to be studied.

Mr. Ralph Phillips, of the Building Station staff, explains the principles behind the solarscope thus:

"To an observer on the earth, the sun appears to travel across the sky in a circular path, the axis of revolution being tilted from the horizontal at an angle equal to his latitude. Different latitudes are therefore represented on the solarscope by tilting the main arm until the axis of revolution for the mirror arm is at the correct angle. This axis always passes through a fixed point on the model platform.

"The time of day is represented by turning the mirror arm about this axis, through 15 degrees for an hour.

"At the equinoxes (March and September), the sun's path lies in a plane passing through the observer's position and at right angles to the earth's axis, so that its altitude from the horizon at noon is 90 degrees minus the observer's latitude. In winter, the noon altitude decreases, reaching its minimum (for Australia) in June, when it is 23½ degrees lower than at the equinox. Similarly, in December, it is 23½ degrees higher than its equinoctial position.

"The mirror-arm of the solarscope is therefore so arranged that when in the noon position at the equinoxes, light will strike the intersection of the platform and the axis at right angles to the axis. For other seasons, the mirror-arm can be rotated through angles up to 23½ degrees on either side of the central position."

Artificial Sky to Study Reflected Light

The artificial sky, designed for the study of direct and reflected light inside a building, has in common with the solarscope only the sunlight which, in addition to direct light through window, door or skylight, is the source of the indirect light reflected from the earth outside on to ceilings and thence to wall or floor inside.

Its purpose is to overcome the problem encountered by all lighting engineers in the study of daylight — the continual change in natural light intensity from the sky caused by cloud movement and other factors.

While direct light from the sky received at a point inside a building can be calculated, this is not so with light reflected from walls and ceilings. Measurement is necessary for reflected light, and, unless the source of the reflected light is of constant strength, the series of measurements covering a whole room or building is useless.

The artificial sky, used with models, offers the only chance of obtaining such a constant source of original light. It is felt that ultimately this apparatus may be used

to determine sufficient data to enable reflected light to be calculated as may now be done with direct light.

At present, the artificial sky at the Experimental Building Station is only in model form. It is an inverted bowl 4 ft. across and 14 in. deep, lit by a battery of electric globes which give an illumination at the centre of 360-foot-candles.

The full-scale apparatus will have a bowl about 24 ft. across and 7 ft. deep. It will be elevated, and fitted with a platform so that scale models can be held at the level of the bowl-base and measurements taken inside them.

The only similar equipment in the world, as far as officers of the Building Station are aware, is an artificial sky in Sweden devised for similar purposes. Details of this were supplied by the Royal Institute of Technology, Stockholm. The Australian scientists have worked out modifications for this apparatus.

The Swedish "bowl" is built up of sections curved in two directions to provide a perfect segment of a hollow spheroid. The Australians built a model to test whether effects equally good could not be produced more economically by building the dome in sections curved only one way, so that the lip of the bowl would form a 12-sided figure instead of a circle.

Satisfied with the results of their test, they have also decided to modify the centre of the bowl to a flattened section instead of a continued curve, and to embody a vented ceiling.

Another modification proposed is the replacement of a battery of 16 — 300 watt spotlights, as used by the Swedish scientists, by a continuous fluorescent light tube round the inner edge of the bowl.

Mr. Ralph Phillips, of the Experimental Building Station, says that as well as giving a closer approximation of normal daylight — important when studying light reflected from coloured surfaces, though not of such importance when dealing with white and light grey surfaces — fluorescent light will generate much less heat than other lamps. This will enable the operator to work in cooler conditions.

The artificial sky will be housed in a special building intended for general study of light under Australian conditions. The Experimental Building Station is linked with the Standards Association of Australia in work on a code of natural lighting for schools. The Station's studies will be part of this work.

Scientists of the station say that though it is believed that light from Australian skies is more intense than in some other parts of the world, there is no definite proof of this. They expect to begin soon on a continuous series of measurements of the light of the sky, so that these can be related to the readings made with models, and some comparison made with the intensities provided by artificial lighting.

Until some idea of the intensity of Australian daylight is established it is considered that recommendations by overseas authorities should be regarded as only approximate.

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NEWS FROM THE INSTITUTE

ALBERTA

One of the Edmonton daily newspapers recently published an editorial criticising the professions generally as being so exclusive in their terms of admission as to become "close corporations". This was naturally followed by several letters to the editor, some supporting, some combating the contention. The architectural profession was included in the strictures but without specific charges against them. No such charge could, indeed, be sustained in regard to the Alberta Association of Architects, nor were there in the article any suggestions made which the profession could adopt that would better the methods actually in force for admission to the profession. There was a suggestion that examinations should be held by examiners entirely outside the professions and that examinations should be a function of the provincial government. This suggestion may sound democratic, but it would be surely inefficient. Candidates must have certain definitely technical qualifications such as could only be properly judged of by professional architects, whom it would be absurd to exclude from the examining board. It is quite right, however, that the public should know and be satisfied that examinations are fairly conducted in the public interest.

In the Province of Alberta the examining board is appointed by the general faculty of the University of Alberta, a government-maintained institution. The faculty asks the Alberta Association of Architects to nominate suitable examiners from their own body. From these nominees the faculty makes its own selection. At present the board of examiners consists of seven members. Of these, four are practising architects, three are members of the university staff and are not architects. One of these staff members sets the examination on sanitation, heating and ventilation, another that on theory of structures and a third that on properties and uses of materials. The architectural members set the questions on historical architecture, on building construction, on professional practice and on design. It has been the practice that the chairman is one of the practising architects, so that on an ordinary vote there is an equal division between architects and non-architects. The registrar of the university sits in at all meetings of the examining board to ensure that all proceedings are in accord with university practice. He provides valuable advice.

In order to secure fairness in the examinations, every question set is read before the whole board, criticised and finally approved. The whole board thus assumes responsibility for every examination paper. This is by no means a mere form. It results in considerable revision of the questions both in substance and manner of statement. Individual examiners are cleared of imputation of personal idiosyncrasies. After examination the values assigned by each examiner are similarly reviewed by the whole board and the candidate is then called in for oral examination before his marks are finally adjusted for the record. A candidate who considers that he has been unfairly marked may appeal to the faculty. His papers are held by the university as evidence for or against him.

Candidates write their papers under pseudonyms. It may sometimes be impossible that no examiner knows the identity of a candidate, but for the most part he is generally entirely unknown to the majority of the board.

A comprehensive examination is a severe test. It requires a candidate to have at his fingers' ends much that in actual practise he would seek reference to. Consideration is given to this. At present the majority of candidates for admission are graduates of recognised schools of architecture. These are exempt from the examinations but must produce satisfactory evidence that they have worked under a registered architect for the term required by the Architects Act.

In some professions a large entrance fee is charged. In Alberta this is probably much too low as is also the annual fee. These are fixed by statute.

Cecil S. Burgess

CLASSROOMS, THEIR SIZE AND SHAPE

(Continued from page 159)

of our school plant. Not only that, it is what we should have. Within certain protective limits every classroom and school facility should be at the disposal of the groups of our citizenry when school itself is not in session.

This is something that can stand fullest exploitation. We have mentioned night school. The canning facilities of the home arts department should be open on application to housewives lacking the requisite facilities, but demonstrating the ability to use those of the school. The garage and its tools can well be utilized to repair farm machinery or instruct distant farmers in how to perform the same job. An infinite amount of instruction can be carried on in the classrooms. And the uses of the school auditorium and theater are too familiar to be detailed.

These are matters to bring up when the budget for a new school is being set. Many a citizen thinks that the day he received his diploma all that a school could do for him was behind him. For a variety of causes and for any number of reasons he may again walk the halls of a school to his continuing profit. Let us hope, incidentally, that the halls walked are the bright, warm, well-lighted ones of modern design, not the gloomy, dismal tunnels of yesteryear.

CONTRIBUTORS TO THIS ISSUE

J. A. G. Easton, M.R.A.I.C., P.Eng.

Born at Moffat, Scotland in 1895. Started Civil Engineering with the Canadian Pacific Railway Company in 1911. Experimental Engineer with Canadian Aeroplanes Limited from 1915, to 1918. Chief Engineer with United Aircraft Engineering Corporation, New York City from 1918 to 1922. Engineer and Superintendent with Ericson Aircraft Ltd., Toronto 1922 to 1924. Engaged in private practice architect and engineer in Toronto 1924 to 1926.

Entered the education field in 1926 as teacher of Architectural Draughting and then Director of Draughting and Shopwork at the Danforth Technical School. Became Shop Director of the Ontario Training College for Technical Teachers in 1938. Loaned to the Department of National Defense in 1940 as Technical Adviser to the Commandant, Canadian Army Trades School. In 1941, Director of Training for Ontario, Dominion Provincial War Emergency Training Programme which included preliminary trades training for the armed forces and training for war industry.

In 1944, Technical Director for Ontario, Canadian Vocational Training, which was set up to offer training to discharged members of the forces for re-establishment.

Returned to the Ontario Department of Education in 1946 as Technical Adviser to the Department.

Lawrence B. Perkins

A recognized authority on modern school design, co-author of the book *Schools* on that subject. He received his B. Arch. from Cornell University in 1930, formed his own firm, Perkins & Will, in 1935. Since then he and his partners have completed, planned, or received commissions to execute more than $50,000,000 in elementary, high school, college, and university buildings. A member of the American Institute of Architects, American Association of School Administrators and the Committee on School Lighting of the Illumination Engineering Society, he is also chairman of the Evanston Plan Commission.

Leslie Thomas

A mechanical engineer associated with the firm of Shore and Moffat, Architects, Toronto. Mr. Thomas graduated from Queen's University in 1930. His interest in the application of engineering to architecture comes naturally. His grandfather, Fred Thomas, practised in Ottawa for many years as a Civil Engineer and Architect, and was active in the early days of organizing the practice of architecture in Ontario.

OBITUARY

CHARLES A. FOWLER

One of Eastern Canada's outstanding Architects, and a highly-esteemed resident of Halifax for many years, Charles Allison Fowler passed away suddenly on Saturday, March 4th, 1950. His untimely death at the age of 59 came as a severe shock to his many friends and associates for he had been in apparent good health right up to the day of his death.

His work both as a construction engineer and architect gave him prominence throughout the Dominion, and particularly in Eastern Canada, where many fine buildings testify to his outstanding ability. Among his more recent works are included the Halifax County Vocational High School, the Queen Elizabeth High School and Auditorium, a Men's Residence at Mount Allison University, and the new addition to Mount Saint Vincent College, to list only a few.

Born in Amherst, N. S., in 1891, Mr. Fowler received his early education at Mount Allison University where he obtained his Bachelor of Science Degree. He completed his education at the Nova Scotia Technical College, graduating in Civil Engineering in 1914. It was not long after graduation, however, that his leanings toward an architectural career materialized, and in 1917 he established his own practice under the name of C. A. Fowler & Company, Architects and Engineers.

At the time of his death Mr. Fowler was President of the Nova Scotia Association of Architects, having served in this capacity on three different occasions. He was also a member of the National Research Council, a member of the Association of Professional Engineers of Nova Scotia and a member of the Engineering Institute of Canada, having been Past President of the Halifax Branch. His many other associations both as a private citizen and as a member of the architectural and engineering professions are too numerous to mention, for he gave generously of both his time and efforts in all community undertakings and contributed his strong support to both these professions.

During the Second World War he served in the Army as Officer Commanding 10th Searchlight Battery, R.C.A., C.A.A., with the rank of Major, and in 1941 was called out for special duty with the Department of National Defence.

Mr. Fowler is survived by his wife, the former Margaret Archibald, Halifax; one daughter, Jacqueline (Mrs. Eric Atkins), Montreal; and one son, C. A. E. Fowler, who was associated with his father at the time of his death, and who will be carrying on the work of his father's firm.

Allan F. Duffus

ACKNOWLEDGMENT

The Schools of Architecture issue for April was organized by **Mr. Emile Venne** of École des Beaux-Arts, Montreal. The Editorial Board expresses their indebtedness to him for the trouble he took in assembling material for the five schools.

Editor

Facts by Pilkington about Glass
FOR ARCHITECTURAL STUDENTS

NO. 42 INSTALLATIONS. REEDED GLASS

AN EXAMPLE OF REEDED GLASS IN OFFICE BUILDINGS

Amongst the many types of Figured and Cathedral Glass manufactured Chance Reeded Glasses express, in terms of glass, the tendency of the best building design today, which relies upon simple statement and the effect of movement to carry the eye smoothly to a desired point. Simple in design, the smooth surfaces of Chance Reeded Glasses do not collect dust and are therefore easily kept clean.

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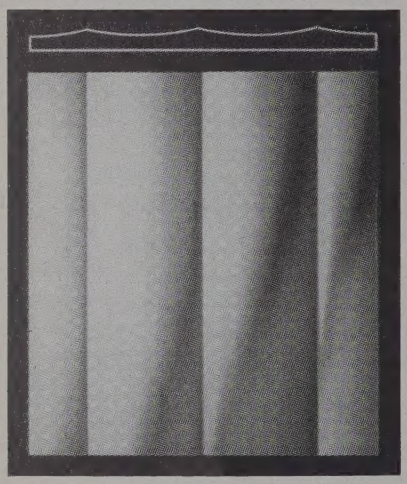

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